

Lecture 14:  
Regression discontinuity I

**PPHA 34600**  
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# An example: impacts of bombing on military success

## Policy issue:

- People fight a lot of wars
- Two distinct approaches: firepower vs. hearts-and-minds
- Which of these is more effective?

## Approach:

- Look at differential bombing across regions in Vietnam
  - Bombing locations aren't random
  - ...but are determined by a policy rule:
  - Military algorithm with rounding
- Use a RD model to estimate treatment effects

# Estimating the effects of overwhelming firepower

They run a version of:

$$Y_i = \tau D_i + f(X_i) + \varepsilon_i \text{ for } c - h \leq X_i \leq c + h$$

where

$Y_i$ : outcome in hamlet  $i$

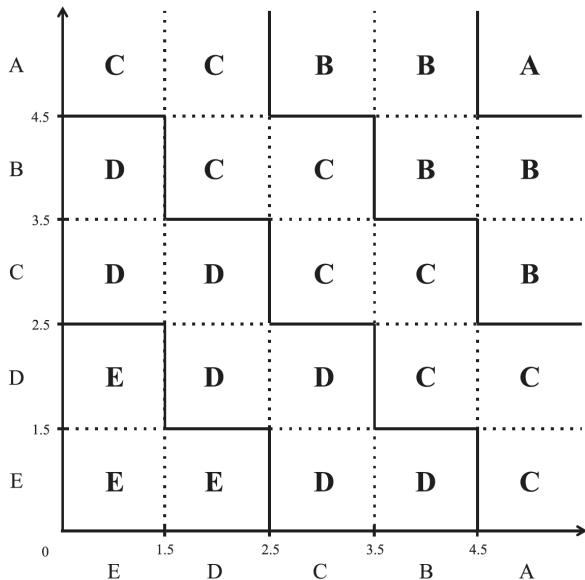
$D_i = \mathbf{1}[X_i \leq c]$  is the treatment indicator

$c$  is a severity threshold

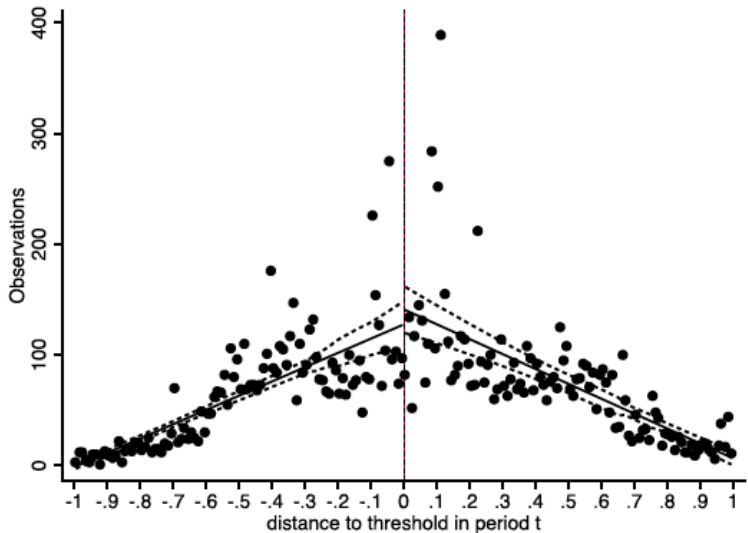
$f(X_i)$  is a flexible function of the running variable,  $X_i$

$\varepsilon_i$  is an error term

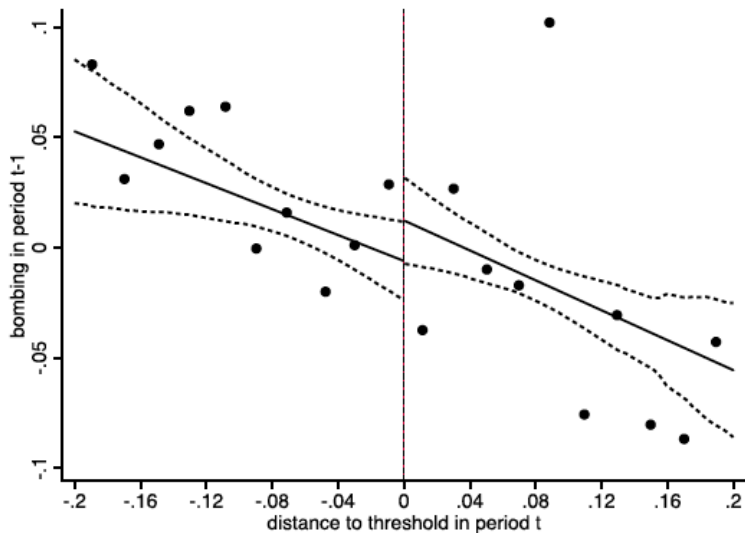
# Identification strategy



# Validity of identifying assumptions



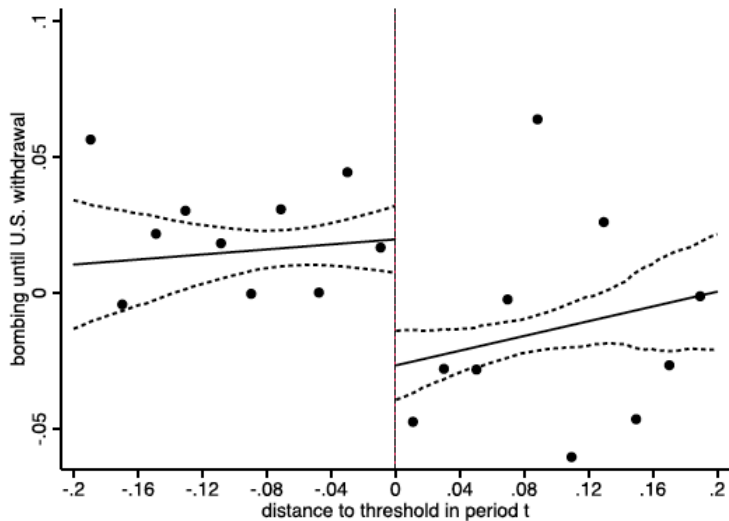
# Validity of identifying assumptions



# Validity of identifying assumptions

	$t - 1$		Full preperiod	
	RD coeff. (1)	Std. err. (2)	RD coeff. (3)	Std. err. (4)
Bombing	-0.001	(0.018)	0.020	(0.016)
Security				
Security LCA	-0.002	(0.015)	0.002	(0.015)
Enemy forces present	-0.017	(0.018)	-0.008	(0.014)
Village guerrilla squad	0.026	(0.021)	0.015	(0.019)
VC main force squad	-0.019	(0.022)	-0.021	(0.019)
VC base nearby	0.022	(0.018)	0.012	(0.017)
VC attack	0.007	(0.015)	0.005	(0.012)
Active VC infrastructure	-0.013	(0.018)	-0.022	(0.017)
% households participate VC	-0.003	(0.005)	-0.005	(0.006)
VC propaganda	-0.019	(0.014)	-0.018	(0.014)
VC taxation	-0.024	(0.020)	-0.019	(0.019)
Troops				
Friendly forces nearby	-0.02	(0.024)	-0.004	(0.019)
U.S. operations	0.006	(0.005)	0.005	(0.003)
U.S. initiated attacks	0.007	(0.006)	0.009	(0.005)
U.S. deaths	0.036	(0.060)	0.036	(0.094)
SVN deaths	0.326	(0.191)	0.141	(0.057)
VC deaths	2.000	(1.950)	0.320	(2.027)
Economic				
Economic LCA	-0.031	(0.016)	-0.024	(0.016)
Nonrice food available	-0.055	(0.019)	-0.038	(0.019)
Manufactures available	-0.036	(0.016)	-0.018	(0.016)
Surplus goods produced	-0.023	(0.020)	-0.011	(0.020)
Fields fallow due to insecurity	0.029	(0.019)	0.017	(0.019)
HH with motorized vehicle	-0.005	(0.005)	-0.004	(0.006)
HH require assistance to subsist	0.003	(0.007)	0.007	(0.007)
Hamlet population growth	0.003	(0.012)	0.006	(0.010)

# Treatment assignment





# Main results

